1. The following table represents the results of the first quiz and the final exam on a sample of seven students of a Math Class at a college:

<table>
<thead>
<tr>
<th>I quiz</th>
<th>50</th>
<th>55</th>
<th>70</th>
<th>70</th>
<th>98</th>
<th>78</th>
<th>98</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final</td>
<td>27</td>
<td>22</td>
<td>53</td>
<td>56</td>
<td>93</td>
<td>56</td>
<td>86</td>
</tr>
</tbody>
</table>

(a) (5 points) Draw the scattered plot of the set of data. Using only the scatter diagram would you estimate the correlation coefficient to be positive, negative, or zero? Explain your answer.

(b) (5 points) Compute the correlation coefficient is $r$ and interpret your result.

(c) (10 points) Find and plot the least square line, make sure to include the point $(\bar{x}, \bar{y})$ and the $y$-intercept.

(d) (5 points) If a student obtains 60 in the first quiz, what will be the predicted grade for the final?

2. A number is selected randomly from the list \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}. Consider the following events:

A= The number selected is less or equal to 7. B= The number selected is more than 2.

(a) (5 points) Compute $P(A)$ and $P(B)$.

(b) (5 points) Explain the meaning in this situation of the event $A \cap B$. Find $P(A \cap B)$.

(c) (5 points) Explain the meaning in this situation of the event $A \cup B$. Find $P(A \cup B)$.

3. Three cards are randomly selected from a standard 52 card deck without replacement. Find the probabilities of the following events:

(a) (5 points) The first two cards are Kings and the third is an Ace. Give an example of two events that are dependent.

(b) (5 points) Either the first two are Kings and the third card is an Ace or the first two are Aces and the third one is a King. Give an example of two events that are mutually exclusive.

(c) (5 points) Suppose that the problem is changed to do it with replacement. What would be the probability of selecting two Kings and an Ace in that order. Identify two independent events in this case.

4. In a statistics class there are 18 juniors and 10 seniors; 6 of the seniors are female, and 12 of the juniors are males. If a student is selected at random, find the probability of selecting the following:

(a) (3 points) A junior or a female.

(b) (3 points) A senior or a female.

(c) (3 points) A junior or a senior.

5. Calculate the following binomial coefficients:

(a) (5 points) $C_{1000,2}$
6. (6 points) How many different groups of three symbols can be formed using the set \{1, 2, 3, 4, %, $\}? How many different passwords with three symbols can we made using the same set?

7. Consider the following probability distribution:

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>P(x)</td>
<td>.21</td>
<td>.12</td>
<td>.18</td>
<td>.25</td>
<td></td>
</tr>
</tbody>
</table>

(a) (3 points) Sketch the graph of the distribution.

(b) (5 points) Calculate the expected value.

(c) (5 points) Calculate standard deviation.

8. A baseball player hits the ball 40\% of the times. What is the probability of getting:

(a) (3 points) Exactly four hits in 12 opportunities.

(b) (3 points) At most four hits in 12 opportunities.

(c) (5 points) If the random variable \(X\) represents the amount of hits in 12 opportunities, what kind of distribution of probability is represented in this experiment? what is the expected value \(\mu\) and standard deviation \(\sigma\)?